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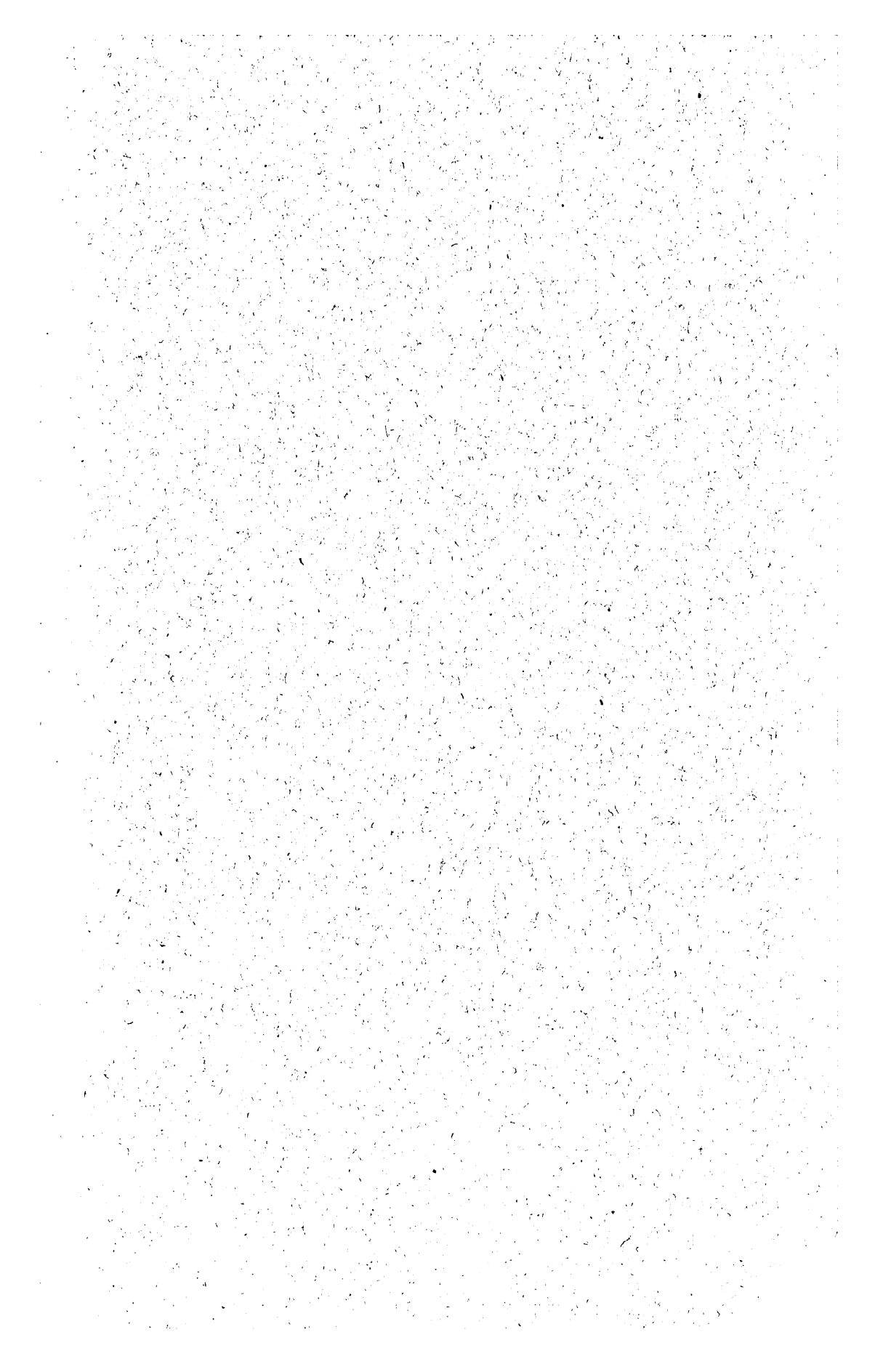
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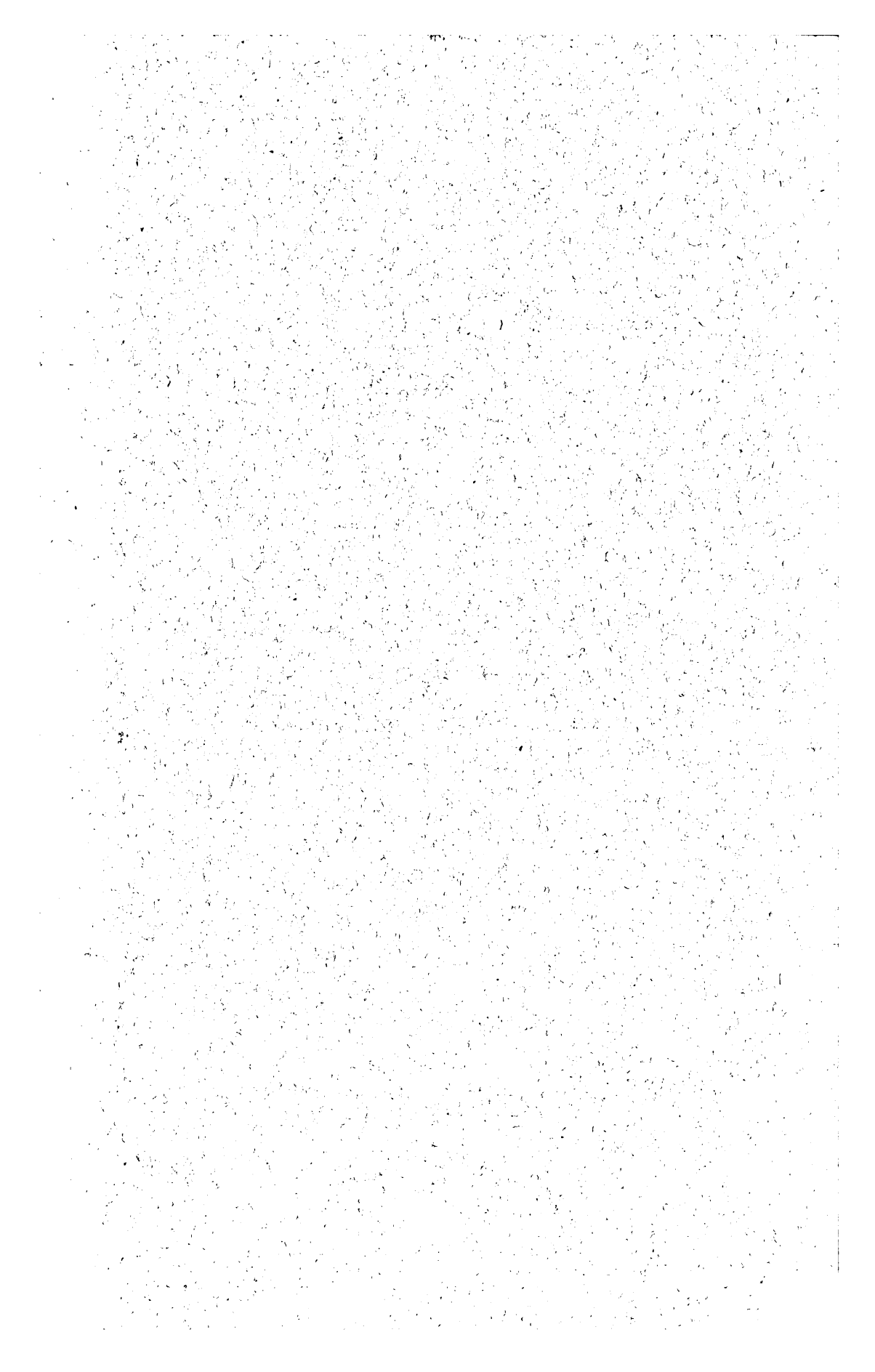
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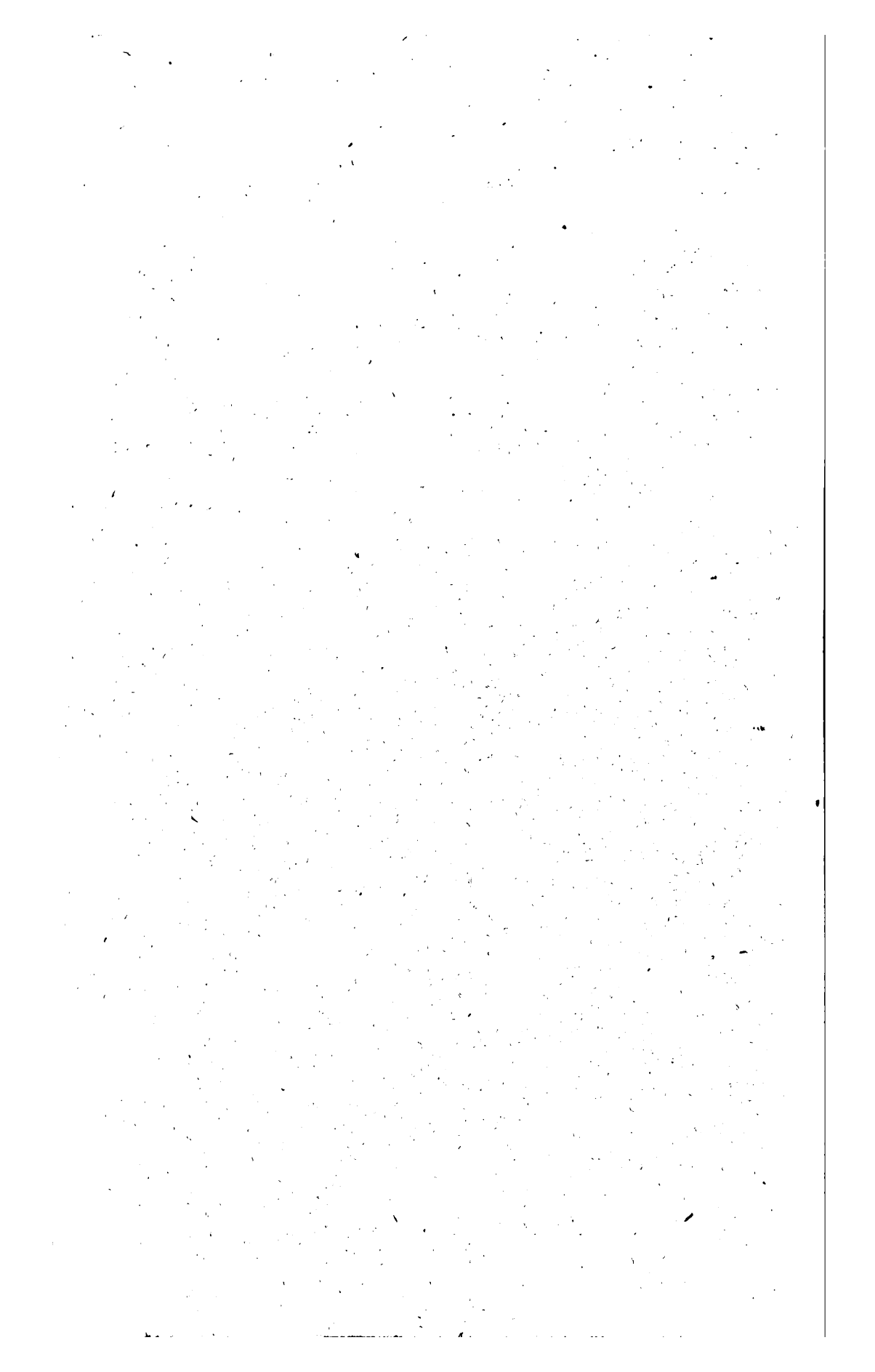
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SMITHSONIAN MISCELLANEOUS COLLECTIONS.

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TO THE

LITERATURE OF COLUMBIUM:

1801-1887.

BY

FRANK W. TRAPHAGEN, PH. D.

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AND IN THE MONTANA SCHOOL OF MINES.



WASHINGTON:
PUBLISHED BY THE SMITHSONIAN INSTITUTION.
1888.

PREFACE.

The following "Index to the Literature of Columbium" has been published upon the recommendation of the Committee on Indexing Chemical Literature, of the American Association for the Advancement of Science. In its original draft the word "niobium" was used in place of "columbium;" but upon suggestion from members of the Committee the author consented to a change. It is well known that the name columbium, originally given by Hatchett, has clear priority; while "niobium," and its supposed twin "pelopium," grew out of errors made by Rose. Although in European treatises the name "niobium" has generally been adopted, no good reason for the substitution has ever been offered, and all the accepted rules of nomenclature demand the retention of columbium. This note has been written at the request of Professor Traphagen.

F. W. CLARKE.

INDEX TO THE LITERATURE OF COLUMBIUM, 1801-1887.

BY FRANK W. TRAPHAGEN.

DATE.	AUTHOR.	REMARKS.	REFERENCES.
1801--	HATCHETT -----	Discovery of element--	Phil. Trans. Roy. Soc., 1802, xcii, 49. Chem. J., Crell, 1802, i, 197, 257, 352. Ann. der Phys., Gren, x, 500; xi, 120. Nicholson's J., Jan., 1802, 32.
1809--	WOLLASTON -----	Identity of columbium and tantalum.	Phil. Trans. Roy. Soc., 1809, xcix, 246. J. für Chem., Schweigger, i, 520. Ann. der Phys., Gren, xlii, 50.
1811--	WOLLASTON -----	Element -----	Ann. der Phys., Gren, xxxvii, 98.
1817--	LEONHARD and Vo- GEL.	Identity of columbium and tantalum.	Königl. Acad. der Wiss., 1817.
1839--	WÖHLER -----	Properties of oxide--	Ann. der Phys., Pogg., xlviii, 91.
1840--	H. ROSE -----	Researches -----	J. für Chem., Schweigger, xxi, 60.
1844--	H. ROSE -----	Researches -----	Ber. d. Chem. Ges., 1844. J. prakt. Chem., xxxiv, 36. Ann. der Phys., Pogg., lxiii, 817.
1846--	H. ROSE -----	Researches on com- pounds and miner- als.	Ann. der Phys., Pogg., lxix, 115. Berzelius' Jsb., 1846, xxv, 158.
1846--	HERMANN -----	Oxides -----	J. prakt. Chem., xxxviii, 91.
1847--	H. ROSE -----	Acids in columbite--	Ann. der Phys., Pogg., 1847, 4. J. prakt. Chem., xli, 219.
1848--	H. ROSE -----	Effect of temperature on specific weight.	J. prakt. Chem., xlii, 254.
1848--	SCHNEIDER -----	Niobic and pelopie acids in Wöhlerite.	Ann. der Phys., Pogg., lxxii, 565. Jsb. Chem., 1848, 1208. Mineralog. Forsch., Kenn., 1849, 197.
1848--	HERMANN -----	Ilmenic, niobic, and pelopie acids.	J. prakt. Chem., xxxi, 94; xl, 475. Berzelius' Jsb., xxv, 875. Ann. Chem., Liebig, lxi, 264. Jsb. Chem., 1848, 1205.

DATE.	AUTHOR.	REMARKS.	REFERENCES.
1848--	HERMANN -----	Niobic and pelopie acids in tantalic acid.	J. prakt. Chem., XLIV, 207. Jsb. Chem., 1848, 1206.
1848--	SCHEERER -----	Niobic and pelopie acids in euxenite and polycrase.	Ann. der Phys., Pogg., L, 149; LXXII, 256, 568. Berzelius' Jsb., XXI, 179; XXVI, 374. Jsb. Chem., 1848, 1206. Jsb. Chem., 1848, 1208.
1848--	H. ROSE -----	Niobic, ilmenic, and pelopie acids.	J. prakt. Chem., XXXVIII, 91, 119.
1848--	HERMANN -----	Ilmenium -----	Ann. der Phys., Pogg., LXXI, 157. Ber. d. Chem. Ges., 1847, 141. Rammels. Handw., 3d supp., 105, 129. Jsb. Chem., 1848, 1209.
1848--	PERETZ -----	Niobic, ilmenic, and pelopie acids.	J. prakt. Chem., XL, 475; XLII, 129; XLIV, 216. Jsb. Chem., 1848, 1210.
1848--	HERMANN -----	Ilmenic acid in pyrochlore and columbite.	Ann. der Phys., Pogg., LXXI, 157; LXXIII, 449. Pharm. Centrbl., 1848, 169.
1848--	H. ROSE -----	Identity of ilmenium and niobium.	Jsb. Chem., 1848, 404.
1848--	H. ROSE -----	Properties metal and oxides.	Ann. der Phys., Pogg., LXXIII, 813. Ann. Chem., Liebig, LXVIII, 165. Pharm. Centrbl., 1848, 145.
1848--	H. ROSE -----	Pelopium -----	Jsb. Chem., 1848, 405. Ann. der Phys., Pogg., LXXIV, 85. Ann. Chem., Liebig, LXXVIII, 165. Pharm. Centrbl., 1848, 439.
1850--	HERMANN -----	Niobates -----	J. prakt. Chem., XLIV, 220. Arch. ph. nat., VIII, 205. Jsb. Chem., 1848, 405.
1851--	EBELMAN -----	Crystals of niobic acid.	J. prakt. Chem., L, 164-172, 185-197. Jsb. Chem., 1850, 748.
1851--	EBELMAN -----	Crystals of niobic acid.	C. R., xxxii, 330, 713. Institut., 1851, 73, 180. Pharm. Centrbl., 1851, 293.
1853--	H. ROSE -----	Researches, identification, and compounds chlorides, etc.	Ann. chim. phys., XXXIII, 34. J. prakt. Chem., LIV, 143. Ann. Chem., Liebig, LXXX, 205. Jsb. Chem., 1851, 14.
1853--	H. ROSE -----	Researches, identification, and compounds chlorides, etc.	Ann. der Phys., Pogg., xc, 456. Ber., 1853, 604. Ann. Chem., Liebig, LXXXVIII, 245.
1854--	CONNELL -----	Name -----	J. prakt. Chem., LX, 468. Pharm. Centrbl., 1854, 11. Institut., 1854, 16. Jsb. Chem., 1853, 353.
1854--	CONNELL -----	Name -----	Phil. Mag. [4], VII, 461. Am. J. Sci. [2], XVIII, 892.

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1854.	CONNELL -----	Name -----	Jsb. Chem., 1854, 353.
1855.	HERMANN -----	Researches on ilmenium, niobium, and tantalum.	J. prakt. Chem., LXV, 54.
1856.	HERMANN -----	Niobium, ilmenium. Researches.	J. prakt. Chem., LXVIII, 65. Chem. Centrbl., 1856, 738. Chem. Gaz., 1857, 10.
1856.	OESTEN -----	Researches -----	Ann. der Phys., Pogg., XCIX, 619; c, 340. J. prakt. Chem., LXX, 120. Jsb. Chem., 1856, 661.
1858.	HERMANN -----	Separation of niobic and tantalic acids. Remarks on pelopic acid.	Ann. der Phys., Pogg., CIII, 148. J. prakt. Chem., LXXIII, 377, 508. Chem. Centrbl., 1858, 165.
1858.	OESTEN -----	Researches -----	Jsb. Chem., 1858, 149. J. prakt. Chem., LXXI, 397; LXXV, 62.
1858.	H. ROSE -----	Niobic and niobous acids, metallic niobium, chloride, etc.	Ann. der Phys., Pogg., CIII, 148. Ber., 1858, 388. J. prakt. Chem., LXXIV, 458, 461. Ann. der Phys., Pogg., CIV, 810. Chem. Centrbl., 1858, 598. Ann. Chem., Liebig, CVIII, 230. Institut., 1858, 854. Ann. chim. phys. [8], LIV, 426. Cimento, VIII, 275.
1858.	H. ROSE -----	Compounds -----	Jsb. Chem., 1858, 151. Ber., 1858, 408. J. prakt. Chem., LXXIV, 461. Chem. Centrbl., 1858, 681. Ann. Chem., Liebig, CVIII, 232. Institut., 1858, 870. Ann. der Phys., Pogg., CIV, 482. Jsb. Chem., 1858, 158.
1858.	H. ROSE -----	Niobium sulphide -----	Ber., 1858, 445. J. prakt. Chem., LXXV, 69. Chem. Centrbl., 1858, 758. Ann. Chem., Liebig, CVIII, 235. Institut., 1859, 5.
1858.	H. ROSE -----	Niobiumfluoride -----	Ann. der Phys., Pogg., CV, 424. Ber., 1858, 448. J. prakt. Chem., LXXV, 71. Chem. Centrbl., 1858, 754. Ann. Chem., Liebig, CVIII, 234. Institut., 1859, 6.
1859.	H. ROSE -----	Chlorides and fluorides -----	Ann. der Phys., Pogg., CIV, 581. Ber., 1859, 549. J. prakt. Chem., LXXVIII, 183. Chem. Centrbl., 1859, 849; 1860, 181. Ann. chim. phys. [8], LVIII, 104. Ann. der Phys., Pogg., CVIII, 273, 465.
1859.	H. ROSE -----	Nitrate -----	Jsb. Chem., 1859, 158. Ber., 1859, 12. J. prakt. Chem., LXXVI, 245.

DATE.	AUTHOR.	REMARKS.	REFERENCES.
1859--	H. ROSE -----	Nitrate -----	Chem. Centrbl., 1859, 204. Ann. Chem., Liebig, cx, 140. Ann. chim. phys. [3], lvi, 111. Institut., 1859, 227. Ann. der Phys., cvi, 141. Jsb. Chem., 1859, 156. Ber., 1859, 439.
1859--	H. ROSE -----	Niobic acid, chloride, sulphide, nitrate.	J. prakt. Chem., lxxviii, 98. Chem. Centrbl., 1859, 678. Ann. der Phys., Pogg., cvii, 409. Jsb. Chem., 1859, 158.
1859--	H. ROSE -----	Salts -----	Ber., 1859, 527. J. prakt. Chem., lxxviii, 102. Chem. Centrbl., 1859, 749. Ann. der Phys., Pogg., 566.
1860--	VON KOBELL -----	Dianium and dianic acid.	Bull. d. k. bayr. Acad. d. Wis- senssch., II Classe, Sitzung V, 10; Mar., 1860. Ann. Chem., Liebig, cxiv, 337. J. prakt. Chem., lxxix, 291. Vierteljahrschr. pr. Pharm., ix, 374. Chem. Centrbl., 1860, 695. Ann. chim. phys. [3], lix, 477. Rep. chim. pure., ii, 360. Am. J. Sci. [2], xxx, 123. Jsb. Chem., 1860, 150, 781.
1860--	H. ROSE -----	Compounds -----	Ber. 1860, 281. J. prakt. Chem., lxxxi, 221. Chem. Centrbl., 1860, 737. Ann. der Phys., Pogg., cxi, 193. Jsb. Chem., 1860, 145.
1860--	H. ROSE -----	Niobous acid -----	Ber., 1860, 296. J. prakt. Chem., lxxxi, 212. Chem. Centrbl., 1860, 738. Rep. chim. pure., iii, 117. Jsb. Chem., 1860, 148.
1860--	H. ROSE -----	Niobates -----	Ber., 1860, 710. J. prakt. Chem., lxxxii, 365. Chem. Centrbl., 1861, 94. Rep. chim. pure., iii, 117. Jsb. Chem., 1860, 148.
1860--	H. ROSE -----	Nitrate -----	Ann. der Phys., Pogg., cxi, 426. Jsb. Chem., 1860, 149.
1861--	NORDENSKIÖLD -----	Niobic acid -----	Jsb. Chem., 1861, 184, 209. Ann. der Phys., Pogg., cxiv, 612.
1861--	HERMANN -----	Dianium -----	J. prakt. Chem., lxxxiii, 106, 317. Rep. chim. pure., iv, 50. Jsb. Chem., 1861, 209.
1861--	VON KOBELL -----	Dianium -----	J. prakt. Chem., lxxxiii, 110, 371, 449. Rep. chim. pure., iv, 51. Ann. Chem., Liebig, cxix, 283. Jsb. Chem., 1861, 209.
1864--	GIBBS -----	Action of H F on co- lumbite.	Am. J. Sci. [2], xxxvii, 355. Chem. News, x, 37, 49.

DATE.	AUTHOR.	REMARKS.	REFERENCES.
1864.	GIBBS -----	Action of H F on columbite. "	Zeitschr. Chem., 1865, 16. J. prakt. Chem., xciv, 121. Chem. Centrbl., 1864, 990. Zeit. Anal. Chem., iii, 899. Jsb. Chem., 1864, 685.
1864.	BLOMSTRAND -----	Chlorides and acids.---	Ofversigt af. Acad. Forh., 1864, xxi, 541. J. prakt. Chem., xcvi, 37. Ann. Chem., Liebig, cxxxv, 198. Zeitschr. Chem., 1865, 548. N. Arch. ph. nat., xxiii, 326. C. R., lxi, 852; lxi, 337. Institut., 1864, 282.
1865.	CARON -----	Niobic acid in tin ore -	C. R., lxi, 1064. Institut., 1865, 395. Zeitschr. Chem., 1865, 747. Chem. Centrbl., 1866, 174. Phil. Mag. [4], xxxi, 142. Jsb. Chem., 1865, 197.
1865.	MARIGNAC -----	Acids and salts. Ilmenic acid.	N. Arch. ph. nat., xxiii, 167; xxv, 5. Ann. chim. phys. [4], viii, 5, 49. Zeitschr. Chem., 1865, 654; 1866, 109. C. R., lx, 234, 1355. Institut., 1865, 220. Bull. soc. chim. [2], iii, 871; v, 119. Ann. Chem., Liebig, cxxxv, 49; cxxxvi, 295. J. prakt. Chem., xciv, 304. Phil. Mag. [4], xxx, 445. Am. J. Sci. [2], xli, 111. Jsb. Chem., 1865, 209.
1865.	VON KOBELL -----	Dianic acid.-----	J. prakt. Chem., xciv, 433; xcvi, 249. Ann. Chem., Liebig, cxxxvi, 299. Jsb. Chem., 1865, 208.
1865.	HERMANN -----	Acids, formula, atomic weight, ilmenium.	J. prakt. Chem., xcv, 65. Zeitschr. Chem., 1865, 659. Zeitschr. Anal. Chem., iv, 268. Jsb. Chem., 1865, 209.
1865.	DEVILLE and TROOST.	Vapor density of chloride.	C. R., lvi, 891; lx, 1221. Institut., 1865, 185. Bull. soc. chim. [2], v, 119. N. Arch. ph. nat., xxiii, 222. Ann. Chem., Liebig, cxvii, 274; cxxxvi, 249. Zeitschr. Chem., 1865, 462. Jsb. Chem., 1865, 210.
1866.	DELAFONTAINE -----	Oxides.-----	N. Arch. ph. nat., xxvii, 167. Zeitschr. Chem., 1866, 717. J. prakt. Chem., c, 117. Jsb. Chem., 1866, 205.

DATE.	AUTHOR.	REMARKS.	REFERENCES.
1866--	HERMANN -----	Oxides -----	J. prakt. Chem., xcix, 21. N. Arch. ph. nat., xxvii, 373. Jsb. Chem., 1866, 205.
1866--	HERMANN -----	Ilmenium -----	J. prakt. Chem., xcix, 30, 279, 287, 290. Jsb. Chem., 1866, 205. Zeitschr. Chem., 1867, 124.
1866--	BUNSEN -----	Flame reactions -----	Ann. Chim., Liebig, cxxxviii, 257. Zeitschr. Anal. Chem., v, 351. Phil. Mag. [4], xxxii, 81.
1867--	MARIGNAC -----	Estimation. Ilmeni- um, niobium.	N. Arch. ph. nat., xxvii, 25. N. Arch. ph. nat., xxix, 265. Ann. chim. phys. [4], xiii, 5. J. prakt. Chem., ci, 459; cii, 448. Zeitschr. Chem., 1867, 721; 1868, 91. Zeitschr. Anal. Chem., vii, 106. Jsb. Chem., 1867, 210.
1867--	HERMANN -----	Constitution of com- pounds.	Bull. de la société impériale de Moscow, 1867, 270. J. prakt. Chem., c, 385; cii, 399. Zeitschr. Chem., 1867, 398. Bull. soc. chim. [2], viii, 171. Jsb. Chem., 1867, 209.
1868--	MARIGNAC -----	Niobium, ilmenium hydrate.	C. R., lxvi, 180. Institut., 1868, 42. N. Arch. ph. nat., xxxi, 89. Bull. soc. chim. [2], ix, 465. Am. J. Sci. [2], xlv, 393. J. prakt. Chem., civ, 426. Zeitschr. Chem., 1868, 117. Jsb. Chem., 1868, 212.
1868--	DEVILLE -----	Niobium -----	Zeitschr. Chem., 1868, 178.
1868--	HERMANN -----	Acids -----	J. prakt. Chem., ciii, 128, 420; cv, 221. Zeitschr. Chem., 1869, 311. Jsb. Chem., 1868, 216.
1869--	RAMMELLSBERG ---	Compounds, atomic weight.	Ann. der Phys., Pogg., cxxxvi, 177-197, 352-372. J. prakt. Chem., cvii, 334; cviii, 77. Jsb. Chem., 1869, 288.
1869--	HERMANN -----	Constitution of miner- als.	J. prakt. Chem., cvii, 139. Bull. de la soc. imp. des Natu- ralistes de Moscow, 1869, 141. Chem. News, xx, 119. Jahrb. Min., 1870, 629. Jsb. Chem., 1869, 1280.
1870--	HERMANN -----	Separation of niobium from ilmenium.	J. prakt. Chem. [2], ii, 108. Zeitschr. Anal. Chem., x, 344. Jsb. Chem., 1870, 989.
1871--	HERMANN -----	Researches -----	J. prakt. Chem. [2], iii, 373, 427; iv, 178-211. Bull. Soc. Chim. [2], xvi, 256. Jsb. Chem., 1871, 287.

DATE.	AUTHOR.	REMARKS.	REFERENCES.
1871--	RAMMELLSBERG---	Composition natural niobates and separation of metallic acids.	Ber., 1871, 157, 198, 406, 584, 874. Institut., 1872, 58, 302. Ann. der Phys., Pogg., cXLIV, 56, 191. J. Chem. Soc., xxv, 189. Chem. Centrbl., 1871, 511. Jsb. Chem., 1871, 1163. Ber., 1872, 17.
1872--	RAMMELLSBERG---	Constitution of minerals.	
1873--	STELZNER-----	Occurrence of minerals in granite.	Min. Mittheil., 1873, 224. Jahrb. Min., 1874, 805.
1875--	JOLY-----	Salts, niobates of Mg Ca, Fe, Yt, Mn.	C. R., LXXXI, 266. J. Chem. Soc. (abs.), xxix, 46. Jsb. Chem., 1875, 222.
1875--	JOLY-----	Oxyfluorides-----	C. R., LXXXI, 1266. J. Chem. Soc., xxix, 888.
1875--	BONG-----	Ferrocyanide-----	Bull. Soc. Chim. [2], xxiv, 268.
1875--	SANTESSON-----	Hydrate, fluoniobates, niobates (K and Na), fluoniobates of Zn, Cd, Mn, Co, Ni, Cu, Fe, Hg.	J. Chem. Soc., xxix, 45. Ber., 1876, 854. Jsb. Chem., 1876, 280.
1876--	JOLY-----	Acids, nitrides, and carbides.	C. R., LXXXII, 1195. Bull. Soc. Chim. [2], xv, 506. Jsb. Chem., 1876, 279.
1877--	J. L. SMITH-----	Researches-----	Abs. J. Chem. Soc., xxx, 277. Am. J. Sci. [3], xiii, 359; xiv, 128. Ann. chim. phys. [5], xii, 255. Zeitschr. Kryst., i, 499. C. R., LXXXIV, 1086. Abs. J. Chem. Soc., xxxii.
1877--	J. L. SMITH-----	Name-----	Ann. Ch. phys. [5], xii, 258. Jsb. Chem., 1877, 288.
1877--	HERMANN-----	Researches, neptunium	J. prakt. Chem., [2], xv, 105.
1878--	J. L. SMITH-----	Researches, mosandrium.	C. R., LXXXVII, 146. Abs. J. Chem. Soc., xxxvi, 12.
1878--	ROSCOE-----	Metal and chlorides---	Chem. News, xxxvii, 25. Abs. J. Chem. Soc., xxxvi, 1272. Jsb. Chem., 1878, 800.
1882--	WELLER-----	Action of hydrogen peroxide on oxides.	Ber., 1882, 2592. Jsb. Chem., 1882, 1292.
1883--	SMITH-----	Method for analysis---	Amer. Chem. J., v, 44, 78 Chem. News, XLVIII, 13, 29.
1883--	BOISBAUDRAN-----	Separation from gallium.	C. R., xcvi, 152; xcvi, 730. Chem. News, XLVII, 100. Jsb. Chem., 1883, 1574.
1883--	DONATH and MAY- ERHOFER.	Atomic volume and affinity.	Ber., 1883, 1588. Jsb. Chem., 1883, 26.
1883--	SEAMON-----	Analysis of a niobate---	Chem. News, XLVI, 205. Abs. J. Chem. Soc., XLIV, 32.
1884--	HAUSHOFER-----	Microscopic analysis---	Ber., 1884, 182. Sitzungsber. bair Akad., xiii, 436-448. Jsb. Chem., 1884, 1551.
1885--	OSBORNE-----	Quantitative determination.	Am. J. Sci. [3], xxx, 329-337.

DATE.	AUTHOR.	REMARKS.	REFERENCES.
1887--	LEVY-----	Color reaction -----	C. R., cv, 1074. Ber., 1887, 24.
1887--	DEMARÇAY-----	Action of carbon tetrachloride upon niobic anhydride.	Abs. J. Chem. Soc., 1887, 304. C. R., crv, 111.
1887--	KNOP-----	Crystallization niobic anhydride.	Abs. J. Chem. Soc., 1887, 329. Zeitschr. Kryst. Min., XII, 610.

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DATE.	AUTHOR.	REMARKS.	REFERENCES.
1801--	HATCHETT-----	Columbite -----	Phil. Trans. Roy. Soc., xcii, 49. Chem. J., Crell, i, 197. Ann. der Phys., Gren., x, 500; xi, 120.
1805--	VALENTINE-----	Columbite -----	Nicholson's J., Jan., 1802, 32. Magazine Encyclop., Dec., 1805, 388. Ann. der Phys., Gren., xxiv, 120.
1811--	GILBERT-----	Columbite -----	Ann. der Phys., Gren., xxxvii, 105.
1827--	LEVY-----	Aeschynite -----	Phil. Mag., i, 27.
1828--	HARTWALL-----	Fergusonite and aeschynite.	K. Vet. Acad. Handl., 1828, 167. Berzelius' Jsb., 1830, ix, 195.
1831--	LEVY-----	Aeschynite -----	Ann. der Phys., Pogg., xvii, 483.
1831--	BROOKE-----	Aeschynite -----	Phil.; Mag., x, 187. Ann. der Phys., Pogg., xxiii, 361.
1836--	THOMSON-----	Columbite -----	Records of General Science, iv, 407.
1844--	HERMANN-----	Aeschynite -----	J. prakt. Chem., xiii, 221. J. prakt. Chem., xxxi, 89.
1846--	H. ROSE-----	Researches on minerals.	Berzelius' Jsb., xxv, 871. Ann. der Phys., Pogg., lxix, 115.
1846--	HERMANN-----	Researches on minerals.	Berzelius' Jsb., 1846, xxv, 158. J. prakt. Chem., xxxviii, 91.
1848--	SCHNEERER-----	Wöhlerite-----	Ann. der Phys., Pogg., lxxii, 565. Jsb. Chem., 1848, 1203. Mineralog. Forsch., Kenn, 1849, 197.
1848--	SCHNEERER-----	Euxenite and poly-crase.	Ann. der Phys., Pogg., l, 149; lxxii, 256, 568. Berzelius' Jsb., xxi, 179; xxvi, 374. Jsb. Chem., 1848, 1206.

DATE.	AUTHOR.	REMARKS.	REFERENCES.
1848--	GREWINCK-----	Specific gravity and composition of American columbite.	Ann. der Phys., Pogg., LXX, 572. Ber. d. Chem. Ges., 1847, 86. J. prakt. Chem., XLI, 219; XLII, 451. Jsb. Chem., 1848, 1207. O. R., XXV, 670.
1848--	BROMEIS-----	Composition of Siberian columbite.	Ann. der Phys., Pogg., LXXI, 157. Ramm. Handw., 8d supp., 118. Jsb. Chem., 1848, 1207.
1848--	HERMANN-----	Composition of columbite from Middletown, Conn.	J. prakt. Chem., XLIV, 207. Jsb. Chem., 1848, 1207.
1848--	DAMOUR-----	Composition of columbite from Bavaria.	Ann. des Minn. [4], XIII, 387; [4], XIV, 428.
1848--	H. ROSE-----	Columbite	Jsb. Chem., 1848, 1208.
1848--	HERMANN-----	Samarskite	J. prakt. Chem., XXXVIII, 91, 119.
1848--	G. ROSE-----	Samarskite	Ann. der Phys., Pogg., XLVIII, 555. Reise n. d. Ural, II, 72. Jsb. Chem., 1848, 1209.
1848--	PERETZ-----	Yttroilmenite and samarskite.	Ann. der Phys., Pogg., LXXI, 157. Ber. d. Chem. Ges., 1847, 141. Rammels. Handw., 8d supp., 105, 129. Jsb. Chem., 1848, 1209.
1848--	HERMANN-----	Pyrochlore and columbite.	J. prakt. Chem., XL, 475; XLII, 129; XLIV, 216. Jsb. Chem., 1848, 1210.
1850--	HERMANN-----	Aeschynite, columbite, polycrase, pyrochlore, etc.	J. prakt. Chem., L, 164-172, 185-192. Jsb. Chem., 1850, 748.
1852--	MÜLLER-----	Columbite	Correspondenz-blatt des zoologisch-mineralogischen Vereins zu Regensburg, 1852, No. 8, 78. J. prakt. Chem., 1853, LXVIII, 183. Jahrb. Min., 1853, 367.
1852--	HUNT-----	Columbite and samarskite.	Am. J. Sci. [2], XIV, 340. Pharm. Centrbl., 1853, 341.
1855--	FORBES and DAHL	Bragite, Fergusonite, and euxonite.	Nyt. Mag. für Naturvidensk., VIII, 3, 213. Jsb. Chem., 1855, 962. J. prakt. Chem., LXVI, 444, 446. Phil. Mag., 1855, 62. Pharm. Centrbl., 1855, 114.
1855--	KENGOTT-----	Tyrite	Ann. der Phys., Pogg., xcvii, 622.
1856--	DESCLOIZEAUX---	Crystallization of columbite.	Ann. Min. [5], VIII, 398.
1856--	CHANDLER-----	Samarskite and columbite.	Misc. Chem. Researches, Dissertation Göttingen, 1859. Ann. der Phys., Pogg., CLXXI, 157; CLXXII, 469; CLXXIII, 449.

DATE.	AUTHOR.	REMARKS.	REFERENCES.
1858--	BREITHAUPT-----	Crystallization of columbite.	Berg- und Hüttenmanischen Zeitung, xvii. Am. J. Sci. [2], xxvi, 349.
1858--	HUGO MÜLLER-----	Composition of columbite.	Q. J. Chem. Soc., xi, 243.
1860--	NORDENSKIÖLD----	Minerals-----	Oefversigt af. Königl Vetenscap Akademien Forhandl., 1860, No. 1. Ann. der Phys., Pogg., cxi, 278. J. prakt. Chem., lxxxi, 193. Jahrb. Min., 1861, 829. Chem. Centrbl., 1860, 969. Rep. chim. pure., iii, 181. Jsb. Chem., 1860, 778.
1860--	BERZELIUS-----	Mineral from Ytterby	Afhand. i Fisik, Kemi, och Miner., iv, 281. Jsb. Chem., 1860, 780.
1860--	DESCLOIZEAUX-----	Wöhlerite-----	Ann. Min. [5], xvi, 229. Jsb. Chem., 1860, 780.
1860--	KOKSCHAROW-----	Aeschnite-----	Materialien zur Miner., Russlands, iii, 384. Jsb. Chem., 1860, 781. Ber., 1860, 296.
1860--	H. ROSE-----	Columbite, samarskite, euxenite, Fergusonite, tyrite.	J. prakt. Chem., lxxxi, 212. Chem. Centrbl., 1860, 738. Rep. chim. pure., iii, 115. Ann. der Phys., Pogg., cxii, 468, 482, 549. Jsb. Chem., 1860, 146, 152.
1860--	DEVILLE and DAMOUR.	Columbite, euxenite---	Instit., 1861, 152. Jsb. Chem., 1860. Note, page 152.
1861--	HERMANN-----	Columbite, samarskite.	J. prakt. Chem., lxxxiii, 106, 317. Rep. chim. pure., iv, 50. Jsb. Chem., 1861, 209.
1861--	SCHRAUF-----	Columbite-----	Wien. Akad. Ber., xlv, 2d Abth., 445. Jahrb. Min., 1862, 234.
1862--	H. ROSE-----	Columbite, samarskite.	Ber., 1862, 138, 166. Chem. Centrbl., 1862, 262. J. prakt. Chem., lxxxv, 438. Rep. chim. pure., iv, 456. Am. J. Sci. [2], xxxv, 427. Jsb. Chem., 1862, 753.
1862--	KOKSCHAROW-----	Specific gravity of aeschnite.	Materialien zur Min. Russ., iv, 58.
1863--	H. ROSE-----	Columbite, samarskite, Fergusonite, tyrite.	Ann. der Phys., Pogg., cxviii, 339, 406, 497. Bull. Soc. Chim., v, 491. Jsb. Chem., 1863, 827.
1863--	LETTSON-----	Crystalline form of columbite.	Phil. Mag. [2], xxv, 41. Jahr. Min., 1863, 594.
1863--	MICHAELSON-----	Bragite, tyrite-----	J. prakt. Chem., xc, 103. Jahrb. Min., 1864, 236.
1863--	NORDENSKIÖLD----	Columbite-----	Oefversigt af. K. Vetenscap Academien Verh., 1863, 433.

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1863--	NORDENSKIÖLD ---	Columbite-----	Ann. der Phys., Pogg., CXXII, 604. Jahrb. Min., 1865, 86. J. prakt. Chem., xcv, 119. Jsb. Chem., 1864, 856.
1863--	CHYDENIUS -----	Analysis of pyrochlore.	Jsb. Chem., 1868, 881.
1863--	FINKENER and STEPHENS.	Composition of samarskite.	Verhandl. Min., St. Pet., 1863, 13.
1864--	GIBBS -----	Action of hydrofluoric acid on columbite.	Am. J. Sci. [2], XXXVII, 855. Chem. News, x, 37, 49. Zeitschr. Chem., 1865, 16. J. prakt. Chem., xciv, 121. Chem. Centrbl., 1864, 990. Zeit. Anal. Chem., III, 399. Jsb. Chem., 1864, 885.
1864--	BLOMSTRAND -----	Columbite-----	Oefversigt af Akad. Förh., 1864, xxi, 541. J. prakt. Chem., xcvi, 46.
1865--	HERMANN -----	Aeschynite, samarskite, Fergusonite, pyrochlore, Wöhlerite.	J. prakt. Chem., xcv, 103, 108, 123, 128. Jahrb. Min., 1866, 89. Jsb. Chem., 1865, 898.
1865--	MARIGNAC -----	Columbite -----	N. Arch. ph. nat., xxv, 24.
1866--	SHEPARD -----	Specific gravity of columbite.	Am. J. Sci. [2], XLII, 248. Jahrb. Miner., 1867, 198. Jsb. Chem., 1866, 944.
1866--	BLOMSTRAND -----	Analysis of columbite.	Om tantalmetalliana, Lund., 1866. J. prakt. Chem., xcix, 40. N. Arch. ph. nat., xxvi, 337. Jsb. Chem., 1866, 944.
1866--	HERMANN -----	Analysis of columbite and aeschynite.	J. prakt. Chem., xcvi, 350. Jsb. Chem., 1866, 945.
1866--	CHYDENIUS -----	Analysis of euxenite --	Bull. Soc. Chim. [2], vi, 433. Zeitschr. Chem., 1867, 94. Chem. Centrbl., 1867, 751. Jsb. Chem., 1866, 946.
1867--	HERMANN -----	Ilmenorutile, analysis.	J. prakt. Chem., c, 100. Bull. Soc. Chim. [2], viii, 42. Jsb. Chem., 1867, 997.
1867--	MARIGNAC -----	Analysis and specific gravity of aeschynite, euxenite.	N. Arch. ph. nat., xxix, 282. Bull. Soc. Chim., viii, 178. Jsb. Chem., 1867, 998.
1867--	PHIPSON -----	Columbite -----	C. R., LXV, 419. J. prakt. Chem., ciii, 448. Chem. Centrbl., 1868, 896. Bull. Soc. Chim. [2], viii, 333. Chem. News, xvi, 160. Jsb. Chem., 1867, 998.
1869--	RAMMELLSBERG ---	Yttrotantalite, pyrochlore, euxenite.	Ber., I, 224; II, 87, 216. Zeitschr. Chem., XII, 442. Zeitschr. d. deutsch. geolog. Ges., xxi, 555. Jsb. Chem., 1869, 1229.
1869--	HERMANN -----	Fergusonite, tyrite, bragite.	J. prakt. Chem., cvii, 129. Bull. de la soc. imp. des Naturalistes de Moscow, 1869, 141. Chem. News, xx, 119.

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1869..	HERMANN -----	Fergusonite, tyrite, bragite.	Jahrb. Min., 1870, 629. Jsb. Chem., 1869, 1230.
1869..	HERMANN -----	Samarskite -----	J. prakt. Chem., cvii, 139.
1869..	HERMANN -----	Aeschnynite, euxenite, polycrase.	J. prakt. Chem., cvii, 153. Chem. News, xx, 119. Jsb. Chem., 1869, 1230.
1870..	HERMANN -----	Samarskite, columbite.	J. prakt. Chem. [2], ii, 123. Chem. Centrbl., 1870, 551. Amer. Chemist [2], i, 236. Jsb. Chem., 1870, 1311.
1870..	SHEPARD -----	Columbite -----	Am. J. Sci. [2], L, 90. Chem. Centrbl., 1870, 708. Jsb. Chem., 1870, 1312.
1870..	RAMMELLSBERG ---	Fergusonite and tyrite.	Ber., 1870, 947.
1870..	RAMMELLSBERG ---	Hjelmite -----	Ber., 1870, 926. Chem. Centrbl., 1870, 823. Jsb. Chem., 1870, 1313.
1871..	RAMMELLSBERG ---	Minerals -----	Ber., 1871, 157, 406, 584, 874. Institut., 1872, 53, 302. Ann. der Phys., cxliv, 56, 191. J. Chem. Soc., xxv, 189. Chem. Centrbl., 1871, 511.
1871..	KNOP -----	Pyrochlore -----	Zeitschr. Geolog. Ges., xxiii, 656. Jahrb. Min., 1872, 534. Jsb. Chem., 1872, 1166.
1871..	JEHN -----	Euxenite -----	Jenau Dissertation in Jahrb. Min., 1872, 319. Ann. der Phys., Pogg., cxliv, 595.
1872..	RAMMELLSBERG ---	Aeschnynite and samarskite.	Ber., 1872, 17. Jsb. Chem., 1872, 1128.
1872..	NORDENSKIOLD	Nohlite -----	Jahrb. Min., 1872, 535.
1873..	STELZNER -----	Occurrence of minerals in granite.	Min. Mittheil., 1873, 224. Jahrb. Min., 1874, 305.
1873..	JEREMEJEV -----	Crystalline form of columbite.	Jahrb. Min., 1873, 421.
1873..	GROTH and ARZ- RUNI.	Crystalline form of columbite.	Ann. der Phys., Pogg., cxlix, 285.
1876..	SHEPARD -----	Hermannolite -----	Am. J. Sci. [3], xi, 140. Institut., 1876, 188.
1876..	HERMANN -----	Analysis of Hermannolite.	Jsb. Chem., 1876, 1257. J. prakt. Chem. [2], xiii, 386.
1876..	E. S. DANA -----	Crystalline form of samarskite.	Jahrb. Min., 1876, 662. Am. J. Sci. [3], xi, 201.
1877..	J. L. SMITH -----	Minerals, columbite, samarskite, euxenite, Hatchettolite, Rogersite, Fergusonite.	Am. J. Sci. [3], xiii, 359; xiv, 128. Ann. chim. phys. [5], xii, 255. Zeitschr. Kryst., i, 499. Jahrb. Min., 1877, 728. C. R., lxxxiv, 1036. Abs. J. Chem. Soc., xxxii, 576.
1877..	ALLEN -----	Analysis of Hatchettolite and samarskite.	Zeitschr. Kryst., i, 602. Jsb. Chem., 1877, 1343.
1877..	RAMMELLSBERG ---	Analysis of samarskite and aeschnynite.	Ann. Phys. [2], ii, 668. Ber., 1877, 656.

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1877--	RAMMELLSBERG ---	Analysis of samarskite and aeschynite.	Zeitschr. Geolog. Ges., XXIX, 815. Jahrb. Min., 1878, 529. Jsb. Chem., 1877, 1844.
1877--	DELAFONTAINE ---	Hermannolite -----	N. Arch. ph. nat., LXIX, 176. Am. J. Sci. [8], XIII, 390. Zeitschr. Kryst., I, 508. Jsb. Chem., 1877, 1846.
1877--	NORDENSKIÖLD ---	Analysis of minerals --	Zeitschr. Kryst., I, 508. Jsb. Chem., 1877, 1846.
1877--	DAMOUR -----	Analysis of samarskite	N. Petersb. Acad. Bull., XXIII, 468. Zeitschr. Kryst., I, 284.
1877--	KNOP -----	Dysanalite -----	Jahrb. Min., 1877, 647.
1877--	MALLET -----	Sipylite -----	Am. J. Sci. [8], XIV, 397. Zeitschr. Kryst., II, 192. Jahrb. Min., 1878, 203. Chem. News, XXXVI, 158. Abs. J. Chem. Soc., XXXII, 858.
1877--	DELAFONTAINE ---	Samarskite -----	N. Arch. ph. nat., LXIX, 176.
1878--	DELAFONTAINE ---	Sipylite -----	C. R., LXXXVI, 938. Jsb. Chem., 1878, 261.
1879--	BRÖGGER -----	Aeschynite -----	Zeitschrift Kryst., III, 481. Jsb. Chem., 1879, 1238.
1879--	SCHARIZER -----	Columbite -----	Verhand. Geol. Reichs. aust., 1879, 243.
1880--	COMSTOCK -----	Columbite -----	Zeitschr. Kryst., IV, 633. Chem. News, XLI, 244. Am. J. Sci. [8], XIX, 181.
1880--	JANOVSKY -----	Niobite -----	Zeitschr. Kryst., IV, 616. Wien. Acad. Ber., LXXX, 34. Zeitschr. Kryst., V, 400. Ber. XIII, 139.
1880--	BLOMSTRAND -----	Polycrase -----	Min. Petr. Mitth. [2], III, 94. Zeitschr. Kryst., IV, 524. Jsb. Chem., 1878.
1880--	SHEPARD -----	Yttrotantalite -----	Am. J. Sci. [8], XX, 56.
1880--	HIDDEN -----	Fergusonite -----	Am. J. Sci. [8], XX, 57.
1880--	SHEPARD -----	Rutherfordite -----	Am. J. Sci. [8], XX, 57.
1881--	HIDDEN -----	Aeschynite -----	Am. J. Sci. [8], XXII, 23. Jsb. Chem., 1881, 1409.
1881--	HALLOCK -----	Columbite -----	Am. J. Sci. [8], XXI, 412. Zeitschr. Kryst., VI, 208.
1881--	MALLET -----	Sipylite -----	Am. J. Sci., XII, 52. Zeitschr. Kryst., VI, 208.
1881--	DUNNINGTON -----	Microlite -----	Am. Chem. J., III, 130. Zeitschr. Kryst., VI, 112.
1882--	HIDDEN -----	Columbite -----	Am. J. Sci. [8], XXIV, 372. Jsb. Chem., 1882, 1578.
1882--	G. C. HOFFMANN ---	Samarskite -----	Am. J. Sci. [8], XXIV, 475. Jsb. Chem., 1882, 1578.
1882--	SEAMON -----	Fergusonite -----	Chem. News, XLVI, 205. Abs. J. Chem. Soc., XLIV, 32.
1883--	ROSCOE -----	Samarskite -----	Monit. Scientif. [8], XIII, 246. Jsb. Chem., 1883, 861.
1884--	DONALD -----	Samarskite -----	Chem. News, XLIX, 259. Jsb. Chem., 1884, 1994.

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1884--	BLAKE -----	Columbite, occurrence	Am. J. Sci. [8], xxviii, 840.
1884--	SCHAEFFER -----	Columbite, analysis ---	Am. J. Sci. [8], xxviii, 840.
1886--	DANA -----	Columbite-----	Zeitschr. Kryst., xii, 266-274. Abs. J. Chem. Soc., 1887, 20.
1887--	COSSA -----	Columbite from Gra- veggia.	Gazzetta, xvii, 81-87. Abs. J. Chem. Soc., 1887, 645.
1887--	PICCINI-----	Mineral associated with columbite.	Zeitschr. Kryst. Min., xiii, 302. Abs. J. Chem. Soc., 1887, 1085.
1887--	HEADDON-----	Columbite from Colo- rado.	Zeitschr. Kryst. Min., xii, 518. Abs. J. Chem. Soc., 1887, 847.

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